

Zebra Watch

Your Vigilance
for the Unusual
Can Help Your
Hospitals Stay
Functional

← Emergency

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Scenario 1:

The day goes like any other in a medic's career: Long periods of boredom, punctuated by the adrenaline high that brings you back for each shift. Toward the end of that 8/12/24-hour period, you are looking forward to heading home, or at least to Happy Hour. With an hour left, you get a call to a home where, upon entry, you find several family members obviously ill with a distinctive rash and an unusual sickly smell in the house. All of a sudden it dawns on you that this is what everyone has been talking about for the past several years. This is smallpox—and you and your partner are the first to encounter it. You double-check the chart on differential diagnoses to make sure it isn't chickenpox, and all of the symptoms indicate smallpox. You start to radio in the information and stop, knowing that putting the word *smallpox* over the air makes it public knowledge. You consider describing the symptoms as "possible variola major" and still hesitate. Finally you grab your cell phone and call the base hospital. The base hospital coordinator responds to your call with stunned silence. When you ask for instructions, the response is "Stand by." You wonder where you will be when this night is over.

Vigilance for the unusual by field providers can help hospitals stay running in an emergency.

Scenario 2—Same incident, slightly different response:

A fire crew meets you as you arrive at the scene. One firefighter says, "Strange rash on those folks." You and your partner immediately go back to the bus and don standard precautions, maybe even an N95 respirator. You transport the family members to the hospital, notifying the emergency department over the radio that you're bringing them suspected chickenpox with an unusual rash. The hospital instructs you to hold the patients in the rig outside the ED until a clinician in PPE comes to take a look. The family members are then taken directly to a negative pressure room.

The RN coordinator takes a deep

breath and considers the possibilities. The nurse calls over to the emergency department manager and chief ED physician, using that tone of voice that indicates something more serious than the daily horrors that pass through an ED. While there has been a lot of discussion in the community on terrorism and disease outbreaks, no protocols or designated facilities have been finalized. No facility wanted to be the "smallpox hospital." While there are many considerations at a moment like this, several that are brought up in the initial discussion include:

- If this is real, are we and our colleagues at risk?
- If this is real, are our patients at risk?



- If this is real, how can we reduce morbidity and mortality?
 - If this is real, what does this mean to our hospital?
 - If this is real, what does it mean to our community?
 - If this is real, what does it mean to our world?
- This is a critical moment.

Now What?

Responders in the field and receivers in a clinical setting may have studied the signs and symptoms of the various diseases that might be utilized by terrorists, developed policies and procedures, discussed a potential event at in-service training and participated in occasional drills and exercises. Some, but not many, have had a moment with a bifurcated needle. But this is the real thing.

Back in the ED, several activities are going on simultaneously. An urgent page is made to the Infection Control Practitioner, or ICP (not Incident Command Post). The infectious-disease plan is pulled off the shelf. Staff starts researching smallpox. A discreet call is made to the hospital administrator. When the ICP arrives, a huddled session is convened. The ICP is required to notify public health, and although it has not yet been confirmed that this truly is smallpox, an immediate call to public health is clearly appropriate.

If the EMS responders are held at the scene, as in Scenario 1, they are still waiting for instructions. The response from public health is unequivocal: No one is to leave the house, including the medics. Law enforcement is requested to quarantine the building. Simultaneously, a call goes from local public health to the state public health, which then contacts the Centers for Disease Control and Prevention (CDC). Law enforcement calls the FBI.

Within an hour, the cat is out of the bag. Too many individuals are involved, and the concern for personal and family safety is so great that word is going to get out. Things are going to start escalating in a hurry.

At the scene, the situation is tense. The medics are not happy about being told to stay there, but recognize that there are few alternatives. The medics may or may not be aware that intervention with the smallpox vaccine within a few days of initial exposure should provide protection from the disease. The patient's family members are provided supportive care, primarily intravenous fluids. Outside, law enforcement and public health have established a perimeter. Public health is not accustomed to being in this type of

situation, invoking the "police powers" needed to quarantine or isolate. Law enforcement is looking to the public health personnel for guidance, direction and reassurance. Neighbors are understandably concerned and are not getting enough information.

If the EMS crew has gotten the patient to the hospital, as in Scenario 2, life is getting a bit too interesting. The administrator on call has activated the Hospital Emergency Incident Command System and the facility's emergency plan, and opened an Emergency Operations Center (EOC). Security has begun to control ingress, directing all persons arriving on site to a location near the emergency department. The ED, in cooperation with the ICP, is now carefully evaluating all persons who have been in proximity to the affected victims, and indeed all those seeking medical care, looking for signs and symptoms of smallpox.

The ED manager and ICP decide to contact all the other hospitals in the region to let them know what is evolving and to allow them to take preventive actions. The ICP is attempting to single-handedly implement the components of the Infectious Disease Plan, including implementing airborne precautions. N95 respirators are disappearing off the shelves. Staff is calling for fit-testing. The ICP and executive staff are bemoaning the limited number of negative pressure rooms in the facility. The chief nursing officer has ordered a review of all medical records for the past two weeks to identify any rashes that had not been evaluated as possible smallpox. Staffing has become an issue. The Public Information Officer is developing fact sheets and has begun to address rumor control.

At the city/county Emergency Operations Center, things are tense and hectic. Everyone is looking to the public-health officer for advice. Since the power to invoke a public-health emergency, along with the right to require isolation and quarantine, is usually vested in the health officer, that person could be the Incident Commander, Operations Section Chief, Medical Unit Leader or Technical Specialist, depending on how the community has established its command structure (preferably planned before the incident). An epidemiological investigation is hastily initiated.

And now the feds show up. The agencies likely to be major players are the FBI and CDC. Smallpox is considered to be a weapon of mass destruction, and Presidential Decision Directives 33 and 39 designate the FBI as the lead federal agency in the crisis management phase of a terrorism event. The FBI will have a

strong presence. Its mandate is to investigate the incident, gather evidence, capture the bad guys and be the primary federal contact on-scene. While the FBI does not want to run a hospital or take over an EOC, it will not allow regular activities (except in situations of life safety) to get in the way of doing its job. The peril is that without a robust Incident Command System in place when the FBI arrives, other players risk the possibility of the FBI taking an aggressive posture.

The CDC is the health resource of the federal government and also has the power to isolate, quarantine and otherwise take action to protect the public health. The Department of Homeland Security (DHS) will also be on-scene in one form or another through its agencies. As DHS attempts to find its niche between the National Response Plan/Federal Response Plan/National Incident Management System/Homeland Security Presidential Directives, it is still grappling with how its field presence will take form.

Lockdown in Florida

What does this all mean for first responders, hospitals and local emergency management?

These scenarios, while horrifying, are unfortunately not unlikely. If not smallpox, there are other diseases with a vast potential to wreak havoc on communities. Yes, smallpox holds a special place in our pantheon of fears, and rightfully so. As one of the great killers of humanity—and a disease almost solely of humans—smallpox is capable of causing widespread morbidity and mortality. Fortunately, naturally occurring smallpox has been eradicated.

This article is not intended to address the challenges of smallpox, the debacle over vaccinations or the potential for superstrains that do not respond to vaccines. The focus of this discussion is on how one effectively responds when the genie is out of the bottle.

Let's look at how a recent event manifested. In Lee County, FL, a smallpox scare in October 2002 highlighted both strengths and shortfalls in how we respond to such incidents. Unlike most communities, the Lee County region had already designated one of the three hospitals in the Lee Memorial Health System (LMHS) as the decon hospital. The location had been designated, but the capabilities to manage the event were not in place. According to Connie Bowles, RN, BSN, CEN, emergency services project coordinator for LMHS, the hospital's ED nursing supervisor received a call from EMS field personnel reporting a Priority

2 rash. (The medics, Bowles says, had the same reticence to use the word *smallpox* over the radio as described in Scenario 1.) The medics brought in a severely ill woman. What perks up a physician's interest in such cases is a rash on the palms and the bottom of the feet. When they saw this woman's hands and level of acuity, she was whisked into a negative pressure room. The negative pressure room was located past the ED and down the hall.

One problem with smallpox—and any disease thought to be eradicated (outside certain known locations)—is that most physicians haven't seen it. They may have seen pictures and know what it looks like in a book, but only those MDs who have been around for a long time may have seen smallpox. In this case, the charge nurse determined that a lockdown of the facility was indicated. With more than 100 doors and few security personnel, a good working relationship with the local police department was critical to containment. The decision was made to close the ED, with no one coming in or going out of the entire hospital. Security called the Cape Coral Police Department, with which it had a good working relationship. Officers were there in a matter of minutes. A Code Gray (stay away) was initiated. People who had stepped outside to make a phone call or smoke a cigarette were not allowed back in to join family members in the waiting room. The Public Health Department was called in. Internally, infectious-disease staff responded, along with two board-certified toxicologists who happened to be in the ED. Those players eventually decided that the patient was exhibiting a rare rash that resulted from an overwhelming infection due to chronic antibiotics. The ED was shut down for three hours. During the course of events, the charge nurse called the EMS department to identify the EMS personnel involved. They discovered that one of the medics had gone to a class with another medic who then went to the trauma hospital in their system. That facility was closed for close to an hour.

Lessons Learned in Lee

Lee Memorial Health System, Bowles observes, learned a great deal from that incident.

- The hospital's negative pressure room was in the wrong place. It needed an entrance from the outside (a point addressed in remodeling).
- A significant number of clinicians have not seen many of these diseases—not only the exotic diseases, but also relatively common illnesses such as chick-

enpox and mumps.

- Many of those involved in the response did not recognize that exposure to an infectious disease does not mean the exposed are immediately contagious. In the case of smallpox, the virus must multiply during the incubation period before there is a danger of transmission.

- If the ED is shut down or people cannot come and go, the hospital cannot treat patients. Patients were in the lobby with chest pains. MDs were trapped in the ED. A possible stroke victim could not be taken for a CAT scan to determine whether there was a bleed or a mass.

- When the ED is closed, the hospital cannot serve the community. How does its staff create another location to provide emergency care?

- The interdepartmental and inter-agency learning curve needs to occur prior to an event happening.

Bowles noted that instead of bringing the patient directly to the negative pressure room, the medics might have held her in the ambulance to be examined prior to entering the hospital. In fact, Bowles' ideal scenario resembled that of Scenario 2, with the addition of an outside entrance to the negative pressure room.

Retired FDNY Deputy EMS Chief Zach Goldfarb, EMT-P, CEM, CHSP, who provided the opening Scenario 2, had several thoughts based on his long tenure in the field and managing EMS response in a highly urban area.

"Absent some more information," he says, "the patient would likely be diagnosed as having chickenpox and transported. Unless there were other indicators—such as a Biosafety Level 4 lab in the community, a fermentation tank in the bathroom or a patient who is a research scientist and refusing to answer questions—a medic wouldn't think smallpox. It would likely take an EMS supervisor or ED staffer to realize, 'Strange, this is the fifth case of chickenpox in the past 24 hours. We haven't had more than two cases in the past few months.' Determining whether the rash and pustules are equal, starting at the limbs and working in, are classic signs and symptoms of smallpox. How are they going to tell in the field?"

Much of the medical literature talks about a particular smell that accompanies smallpox. Goldfarb noted, as did Bowles, that only a small number of clinicians over 55 years old could identify that odor. Plus, medics are constantly assaulted by bizarre odors.

"It's putting two and two together—that's important," Goldfarb says. "Let them [medics, EMS supervisors] be sus-

picious. Use good precautions, call in an unusual rash, hold the patient in the rig, transfer into negative pressure rooms. Identification and follow-up are key."

Goldfarb stresses that discussions like this should also emphasize the knowledge base of the response community.

"What is the potential for acquisition or transfer to family? Two endings for the responders, but the patient outcomes are the same. Johnny and Roy [the medics] have four days to get vaccinated. Did they take appropriate precautions? What can they expect in the next 24–48 hours?" What about the fire crew on-scene, as in Scenario 2?

Reversing Occam

The "what ifs" abound. What if these patients were transported or self-presented to several different hospitals? What if others in the area had these symptoms the week before? What if no one made the connection and everyone had been treating these patients for chickenpox?

On a community-wide basis, everyone agrees: Early recognition is key to containing an outbreak. That recognition must start at the level of first contact. That recognition helps prevent acquiring the disease in the field.

Bruce Binder, a medical emergency manager who has spent his career working with both hospitals and medical first responders, talks about three principles.

"First is situational awareness," he says. "Medics need to be aware of the possibility that they are walking into a dangerous clinical event as they enter the patient's environment. Second is willingness to withdraw from a situation the medic is unprepared for. If medics are not outfitted with the proper PPE, they should withdraw and dress for the danger. Finally, use the proper PPE. During a bioterrorist event, PPE is what will keep the first responders from becoming part of the victim pool. We need to worry about our own people before the patients. It doesn't matter if it's smallpox or anything else from plague to flu. If we lose our people due to exposure to illness, they won't be able to be helpful as the smallpox continues in the community."

Binder goes on to emphasize, "We need our medics tomorrow, not just today. We need to enable our medical first responders to be willing to back away from the situation, get the right PPE and then go back in. This lesson is one learned by our fire and hazmat responders long ago. If we are experiencing a terrorist event or a major natural illness in the community, if the medics

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aren't protected, we lose them from the response. Each EMS agency should ask the following questions: Do the medics have enough training to recognize that this is really smallpox? Are they trained to back away from situations they don't understand or may not be protected against? Are they wearing the right PPE for the situation? Are they putting themselves at undue risk?

"If the patients bypass EMS and come straight to the ED, they're in before anyone knows about it. ED triage personnel need to be trained to recognize and manage the unusual, using already-written protocols. The question is, do you have the plans and procedures in place and

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understood for when the hoofbeats are really from a zebra? Is the ED communicating with the ICPs, and does it have their support available, not only during the day but also at 2 a.m.?"

Binder's reference to the zebra goes back to a saying used in medical schools in times past: "If you hear hoofbeats, think horses, not zebras." This saying arose from the phenomenon of some medical students becoming convinced they had every disease they'd read about in their studies, some most exotic. The admonition to clinicians was that if someone comes in complaining of flulike symptoms, they probably just have the flu. It was a variation of that old bit of wisdom known as Occam's Razor: The simplest answer is probably the most likely.

Today we ask that medical personnel stand that metaphor on its head and think of the exotic (zebras) first, and then eliminate that from the realm of possibilities before moving on to the more likely (horses). One of the guides to bioterrorism diseases for clinicians, published by the Santa Clara (CA) Public Health Department, is called the *Zebra Packet*.

Small things make a big difference. Ensuring that frontline first responders



Rules to Live By

Bruce Binder's three principles of safety at potential bioterror scenes:

1. Situational Awareness

Know the signs and symptoms of diseases that might be used by terrorists. Assess every scene for warning signs.

2. Be Willing to Withdraw

If you're not equipped and fully prepared to deal with what you find, don't try to be a hero. Recognize it and get out of there.

3. Use Your PPE

You're no help if you're incapacitated, and even less if you're dead. You have this stuff for a reason. Don't become part of the problem.

are trained to recognize the unusual; are trained and equipped to use the proper PPE; have the protocols to protect themselves; and have extensive communication and coordination with others with whom they must interact—this will make the dif-

ference between an incident and a disaster. ■

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